Homework

1. A group of animals is playing the game of stacking (human pyramid / tower stacking). Each animal has an integer weight in kilograms, with the lightest being I kg and the heaviest being 16 kg. The rule is that the total weight of all animals above any animal cannot exceed its owr weight. What is the maximum number of layers this group of animals can stack?

2. Several balls are placed in four boxes: A, B, C, and D. Box A contains the most balls. Box A has 4 more balls than box B. The difference between box B and box C is 3 balls. The difference between box C and box D is 2 balls. How many more balls does box A have compared to the box with the fewest balls?

3. Split 23 into the sum of several distinct natural numbers such that the product of these numbers is maximized. What is this maximum product?

4. Use the digits 1 through 6 exactly once to form two three-digit numbers. What is the smallest possible positive difference between these two three-digit numbers?

5. Distribute 100 apples to 10 children such that each child gets a different number of apples. What is the maximum number of apples that the child who receives the fewest apples can possibly get?

6. A cube has six faces. If each face is painted with one color and adjacent faces must have different colors, what is the minimum number of different colors needed?

7. Use the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 exactly once to form five two-digit numbers such that their sum is odd and as small as possible. What is this smallest odd sum?

8. You have 10 rectangular pieces of cardboard, each 2 cm long and 1.5 cm wide. Arrange them tc form one large rectangle. What is the smallest possible perimeter of this large rectangle?

9. Use five odd digits to form several numbers whose sum is 34. Arrange them so that the difference between the largest number and the smallest number is as small as possible. List these numbers in descending order

10. There are 100 natural numbers whose total sum is 1000. Among them, the number of odc numbers is greater than the number of even numbers. What is the maximum possible number of even numbers in this set?

Before you've exhausted all your efforts in exploring and thinking, it's best not to refer to the hints and answers in the assignment
https://archive.org/details/core-lev-2-cbn-2-fundamental-way-of-pursuing-extreme-values-homework-answer

There are many individual problems and question banks available on internet, some of which match the content of this lecture (Core level for pursuing extreme value), so they can be found and practiced too, but the overall efficiency is low.

If you are interested in increasing your practice set on this theme, can request additional exercises from xuyouzhi2015@gmail.com.